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ABSTRACT

The Comprehensive Tests of Basic Skills (CTBS/S) was the nationally standardized, norm-referenced test selected for the Idaho Statewide Testing Program for 1976-77. It provided basic skills measures in reading, language, mathematics, total battery, reference skills, science and social studies. Students in the 4th, 8th and 11th grades from 51 of Idaho's 115 school districts were selected on a random basis for participation in the testing program. The sampling procedure provided a sample representative of the state's students both by geographic location and by size of school attended. Analysis of the data compared the mean (average) performance of Idaho students on the CTBS/S measures to the mean performance of the national norm group, and compared Idaho's upper and lower students to their counterparts in the national norm group. Out of the analysis came three major findings: (1) The mean performance of Idaho's students at the 4th, 8th and 11th grades was either equal to or better than the national norm on each of the 19 CTBS/S total scores for reading, language, mathematics, battery, reference skills, science and social studies. (2) On 41 of the 43 CTBS/S scores reported at the three grade levels, the mean performance of Idaho's students was either equal to or better than the national norm. The two exceptions were 4th grade spelling and 4th grade mathematics computation. (3) Idaho's lower achieving students in the 4th, 8th and 11th grades consistently performed better on the CTBS/S than their national counterpart, with the exception of 4th grade spelling and 4th grade mathematics computation. The relationship of Idaho's upper achieving students to their national counterpart varied from test to test and across the three grade levels. (RC)

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ED134613

# IDAHO
# STATEWIDE TESTING PROGRAM
# FOR 1976-77

JANUARY 1977

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
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ROY TRUBY
STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

BOISE, IDAHO

TM006 021

## FOREWORD

You have in your hands the results of the Idaho Statewide Testing Program for 1976-77. The program used a standardized test of basic skills achievement to measure the educational progress of Idaho students at grades 4, 8 and 11.

Special sampling techniques were used to make sure the program provided an accurate representation of how Idaho students are doing, and they're doing well. I'm pleased with the results.

They point to some areas that need to be strengthened, but in most cases Idaho students are months ahead of their national counterparts.

But most important, the testing program provides us some distinct Idaho benchmarks to measure ourselves against in the future. In the statewide administration of the test, precautions were taken to ensure the accuracy of the results. It was administered over a 10-day period and under comparable conditions by specially trained people.

Although there is always some margin for testing error, we have confidence in the program and faith that these results do accurately represent the performance of Idaho's students.

This first set of Idaho norms should enhance faith in public education in this state, but more important, it also sets some high marks to maintain and exceed in the future.

Roy Truby

Roy Truby
State Superintendent
of Public Instruction

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# IDAHO STATEWIDE TESTING PROGRAM FOR 1976-77

## SUMMARY

The Idaho Statewide Testing Program for 1976-77 was conducted at the request of the Idaho Senate's Health, Education and Welfare Committee. Testing materials and computer scoring services were purchased with federal funds available on a one-time basis only, while other expenses were absorbed by the State Department of Education and the local school districts participating in the project.

The Comprehensive Tests of Basic Skills (CTBS/S) was the nationally standardized, norm-referenced test selected for the program. It provided basic skills measures in reading, language, mathematics, total battery, reference skills, science and social studies.

Students in the 4th, 8th and 11th grades from 51 of Idaho's 115 school districts were selected on a random basis for participation in the testing program. The sampling procedure provided a sample representative of the state's students both by geographic location and by size of school attended. The sample included 977 4th grade students from 56 schools, 995 8th grade students from 25 schools and 997 11th grade students from 13 schools.

Analysis of the data 1) compared the mean (average) performance of Idaho students on the CTBS/S measures to the mean performance of the national norm group, and 2) compared Idaho's upper and lower students to their counterparts in the

national norm group. Out of the analysis came three major findings:

(1) The mean performance of Idaho's students at the 4th, 8th and 11th grades was either equal to or better than the national norm on each of the 19 CTBS/S total scores for reading, language, mathematics, battery, reference skills, science and social studies.

(2) On 41 of the 43 CTBS/S scores reported at the three grade levels, the mean performance of Idaho's students was either equal to or better than the national norm. The two exceptions were 4th grade spelling and 4th grade mathematics computation.

(3) Idaho's lower achieving students in the 4th, 8th and 11th grades consistently performed better on the CTBS/S than their national counterpart, with the exception of 4th grade spelling and 4th grade mathematics computation. The relationship of Idaho's upper achieving students to their national counterpart varied from test to test and across the three grade levels.

# INTRODUCTION

This report describes the procedures and results of the Idaho Statewide Testing Program for 1976-77. The statewide testing program was put together in response to a request from the Idaho Senate's Health, Education and Welfare (HEW) Committee. The Committee asked the State Superintendent to "conduct a random sampling of school districts to try to find out what is now being done in terms of basic skills." The statewide testing program measures where Idaho students stand according to a widely used national standardized test, the Comprehensive Tests of Basic Skills. The purpose of this assessment of achievement is ultimately to improve educational practices for the benefit of Idaho students.

Any valid statewide testing program must have results based on a sample which is truly representative of all Idaho students. This was the first concern which had to be met in designing the testing program.

Since the Idaho Legislature did not appropriate any money for implementation of the program, financial constraints required the statewide testing program to be limited to a sample of students from three grades. Grades 4, 8 and 11 were selected because they represented the "middle grades" of each of the three public school levels--elementary, junior high and senior high. In this way, a survey of basic skills achievement across the entire 12 years of public school endeavor was provided. Furthermore, the random selection of

students at each grade level provided virtually every student in the state (in grades 4, 8 and 11) a chance to be selected as part of the testing program. Thus the Statewide Testing Program for 1976-77 is protected from the principal objection encountered by two earlier efforts to determine the status of basic skills among Idaho students, the objection that results were not complete and/or not representative of all Idaho students.

History of Statewide Assessments

In 1959, a statewide assessment project based on the Iowa Test of Educational Development (ITED) was implemented at grade 11 with funding from the National Defense Education Act until 1965. Then money provided by the Elementary and Secondary Education Act paid for it until 1975. That year the project terminated when options on how to spend federal funds earmarked for testing were shifted from the state to the school districts, leaving the state without means to continue the program. Prior to 1975 most of Idaho's school districts took advantage of the testing program, even though participation was voluntary. Reports included standard individual and group information as well as Idaho percentiles against which each district could rate itself. However, the fact that the project was limited to grade 11 made it difficult to ascertain what was happening statewide in achievement before students became juniors.

In 1975, a special study committee, the Superintendent's Commission on Basic Skills, reviewed test results of 59 school districts. Because it was a "basic skills" commission, it limited its study to reading and mathematics performance of pupils in grade 3 and grade 6, but it did include data covering about 13,000 students (about half the student population at those grade levels).

The major difficulty the commission confronted was that the data, which had been generated through local activity rather than a statewide effort, came from four different standardized tests, each with its own set of norms. Nonetheless, the commission concluded from its analysis that a greater proportion than it expected of Idaho's students were at or above grade equivalent in the areas reviewed. The report of the Superintendent's Commission on Basic Skills had several acknowledged shortcomings. It was recognized that the report covered in rough fashion how Idaho students did only in one year--it was limited in scope and provided no real benchmark to measure future years against.

Program Funding

Money for the new statewide testing program was available only for the 1976-77 school year. Since no state resources were appropriated, federal funds (carryover Fiscal Year 1976 money under Title III of the Elementary and Secondary Education Act) which were earmarked for guidance, counseling and testing were directed to the program. These funds were suf-

ficient only to purchase testing materials and scoring services; all personnel costs of the state and local agencies associated with the program were absorbed by those agencies. Unfortunately, no like federal money will be available in the future to fund Idaho's statewide testing program. These funds are no longer available to us since the Title III program is being phased out.

Program Design

The design of the Statewide Testing Program for 1976-77 did:

(1) provide statewide descriptive data about how Idaho students achieve in comparison to a national norm in the performance areas of reading, language, mathematics, reference skills, science and social studies,

(2) establish special "Idaho norm tables" based on the performance of students in the Idaho sample, and

(3) provide extensive information to participating schools both in the form of standard commercial scoring reports of individual and group results and in the form of the special "Idaho norm tables."

This information has the potential of aiding teachers and administrators in making instructional and administrative decisions.

It's also important to say what the Idaho Statewide Testing Program for 1976-77 is not designed to do and should not be used for. It did not:

(1) measure important aspects of education that are beyond basic skills achievement,

(2) provide for any direct evaluation of specific educational programs or activities,

(3) provide for the comparison of schools or school districts to one another,

(4) provide a way to evaluate teacher effectiveness or administrative efficiency, or

(5) provide information about specific cause(s) of the reported achievement levels.

These provisions are far beyond the possibilities of one standardized test administered with limited resources and authority.

## PROCEDURES

What follows is a description of the methods and materials used for the Idaho Statewide Testing Program for 1976-77. It consists of four sections: the first described the standardized, norm-referenced test used for the program, the second presents a view of the state sample and how it was selected, the third discusses the procedures used to administer the test, and the fourth outlines the data processing and analyses methods used.

### The Test

The Expanded Edition of the Comprehensive Tests of Basic Skills (CTBS/S), published by CTB/McGraw-Hill of Monterey, California, was the standardized test used for the Idaho Statewide Testing Program for 1976-77. The CTBS/S was selected via a competitive bidding procedure among the major test publishers. Minimum acceptable requirements for the test and for the desired scoring services were specified and bids were requested. CTB/McGraw-Hill met, or exceeded, every specification and did so with the lowest of the three bids submitted.

The CTBS/S provided measures of achievement in reading, language, mathematics, reference skills, science and social studies. A list of the 15 separate CTBS/S scores and a brief description of what each score purports to measure is presented in Exhibit 1. The entire battery of tests, with the exception of the science and social studies tests at grade 4,

Reading Vocabulary: recall of synonyms.

Reading Comprehension: literal recall, rewording, determining word meanings from context, main idea, descriptive words, conclusions and structure/style.

Reading Total: combination of the two reading tests.

Language Mechanics: punctuation and capitalization.

Language Expression: grammatical forms, diction, sentence structure and paragraph organization.

Spelling: recall of rules, use of homonyms (to, too, two) and easily confused words.

Language Total: combination of the three language tests.

Mathematics Computation: adding, subtracting, dividing, multiplying, raising to a power and extracting a root.

Mathematics Concepts & Mathematics Applications: number systems/properties, geometric relationships, measurement, sets, graphs, mathematical sentences, problem solving and reasoning. (Note: these two tests are given as a single test.)

Mathematics Total: combination of the three mathematics tests.

Total Battery: combination of the reading, language and mathematics tests.

Reference Skills: parts of a book (title page, table of contents and index), dictionary skills (alphabetization, guide words, dividing words into syllables and multiple definitions), and library use (catalog cards and reference materials).

Science: process skills (knowledge recall, classification, interpretation of data, hypothesis evaluation, etc.) in chemistry, physics, earth science, ecology, botany, zoology and general science.

Social Studies: physical geography, environments, individual and group interactions, social systems, political systems, economic systems and history.

EXHIBIT 1. CONTENT OUTLINE FOR THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S)

were administered to the participants of the statewide testing program. The science and social studies tests were not given at grade 4 because of financial constraints at the time specifications for the testing program were written.

An advantageous feature of the CTBS/S is that it offers a uniform reporting format for all students participating in the program regardless of grade or test level. The CTBS/S battery consists of several levels, each of which measures progressively more difficult and more complex performances within the basic skills areas. For the statewide testing program, grade 4 took Level 1 of the CTBS/S, grade 8 had Level 3 and grade 11 used Level 4. These were the appropriate levels as recommended by the test publisher.

In 1973, the CTBS/S was standardized on a nationwide sample of some 130,000 students from each of the 50 states. The norming sample included public and parochial schools, various types of communities and school districts of various student densities (enrollment per square mile).

The CTBS/S was normed in the month of April, but Idaho students were tested in September. This fact required that Idaho students be compared against a statistical projection of what the nationwide sample might have achieved had it taken the CTBS/S in September rather than in April. The statistical procedure used to determine the projection, which involves a linear interpolation/extrapolation of obtained data, is a fairly standard practice often used by test publishers. The

variance in testing times, however, adds an unknown factor to the comparison of Idaho versus National results.

## The Sample

The sample for the Idaho Statewide Testing Program for 1976-77 included students from grades 4, 8 and 11. These grades represent the "middle" of each of the three divisions of the public educational enterprise: elementary, junior high and senior high. The students were selected by a clustered two-stage sampling procedure. The two stages required 1) that schools be selected on a random basis for participation in the testing program and all their students be tested, and 2) that individual students be selected from all those tested on a random basis from the participating schools.

Selection of Schools. The selection of schools for the 1976-77 testing program was completed during the spring of the 1975-76 school year. The first step was to identify all Idaho schools which offer instruction in grades 4, 8 and 11, and to estimate their probable 1976-77 enrollment.

All schools in the state thus identified were then classified according to two criteria: school size and geographic location. Each school was designated as "small," "medium" or "large." The actual number of students defining each size varied at each grade level. Also, a term indicating geographic location was assigned to each school (based on the regions of the Idaho Association of School Superintendents).

The terms were "northern," "western" and "eastern." Schools of each sort (i.e. small-northern, middle-northern, large-northern, small-western, etc.) then were selected on a random basis. The procedure, which was repeated at each grade level, resulted in the selection of schools from 51 of the state's 115 districts. These included 56 schools for the 4th grade level test, 25 schools for the 8th grade, and 13 schools for the 11th grade test.

Selection of Students. Selection of individual students was made after the testing in the schools had been completed. The sampling procedure called for a specific number of students to be selected on a random basis from each school. Only students who had completed the entire battery were considered eligible for inclusion in the state sample. In total, 91% of the estimated student enrollment of participating schools produced usable answer sheets.

Participating schools were instructed to test all students except those whose mental or physical handicap were of such extent that they could not possibly take the test. Students with specific learning disabilities did participate in the testing.

The sampling design called for the selection of 1,000 students out of each grade from the 3,502 tested in the 4th grade, the 3,815 tested in the 8th grade and from the 2,736 tested in the 11th grade. Due to a margin of error from various sources, however, the selection actually resulted in

a sample which included 977 4th grade students, 995 8th grade students and 997 11th grade students.

Representativeness of Sample. Since statewide results are determined from this sample of students, it seems important to assure the reader that the sample is truly representative of all students in the state. The criteria for representativeness for the Idaho Statewide Testing program for 1976-77 are school size and geographic location.

Exhibit 2 displays at each grade level the number of students in the state sample and the number of students in the estimated state enrollment for each size-area cell (i.e. small-northern, large-eastern, etc.). For example, in the 4th grade there are 32 students in the sample from small-northern schools where there was an estimated enrollment of 718 students.

Exhibit 2 also presents the percentages of students in the state sample and in the estimated state enrollment by school size and by geographic location. For example, in the 4th grade 21% of the sample came from northern schools while 21% of the estimated state enrollment attended those same northern schools; likewise, 14% of the 4th grade sample came from small schools--small schools contained 15% of the total estimated 4th grade state enrollment. These percentage figures indicate the practical representativeness of the sample.

**FOURTH GRADE**

| Location / School Size | NORTHERN | | WESTERN | | EASTERN | | % of Students by School Size | |
|---|---|---|---|---|---|---|---|---|
| | Sample | State | Sample | State | Sample | State | Sample | State |
| Small 1-29 | 32 | 718 | 39 | 701 | 60 | 768 | 14% | 15% |
| Medium 30-65 | 100 | 1161 | 113 | 1663 | 79 | 1372 | 30% | 30% |
| Large 66+ | 77 | 1144 | 318 | 4367 | 159 | 2332 | 56% | 55% |
| % of Students by Location | 21% | 21% | 48% | 47% | 31% | 32% | | |

**EIGHTH GRADE**

| Location / School Size | NORTHERN | | WESTERN | | EASTERN | | % of Students by School Size | |
|---|---|---|---|---|---|---|---|---|
| | Sample | State | Sample | State | Sample | State | Sample | State |
| Small 1-59 | 49 | 849 | 50 | 968 | 50 | 472 | 15% | 14% |
| Medium 60-200 | 50 | 1051 | 150 | 2209 | 151 | 2031 | 35% | 33% |
| Large 201+ | 102 | 1722 | 244 | 4610 | 149 | 2369 | 50% | 53% |
| % of Students by Location | 20% | 22% | 45% | 48% | 35% | 30% | | |

**ELEVENTH GRADE**

| Location / School Size | NORTHERN | | WESTERN | | EASTERN | | % of Students by School Size | |
|---|---|---|---|---|---|---|---|---|
| | Sample | State | Sample | State | Sample | State | Sample | State |
| Small 1-99 | 100 | 906 | 100 | 1541 | 0 | 913 | 20% | 22% |
| Medium 100-250 | 100 | 1213 | 99 | 1401 | 100 | 1510 | 30% | 26% |
| Large 251+ | 100 | 1313 | 299 | 4354 | 99 | 2528 | 50% | 52% |
| % of Students by Location | 30% | 22% | 50% | 46% | 20% | 32% | | |

EXHIBIT 2. FREQUENCY AND PERCENTAGE DISTRIBUTIONS FOR GRADES 4, 8 AND 11 BY GEOGRAPHIC LOCATION AND SCHOOL SIZE FOR STUDENTS IN STATEWIDE TESTING SAMPLE AND ESTIMATED SCHOOL ENROLLMENT

The sample may be considered representative of the state student population in a practical sense in that the sample percentages and estimated enrollment percentages are similar, both by geographic location and by school size. However, there is no generally accepted criterion indicating how wide a difference in percentages can exist before the sample becomes "nonrepresentative." From use of a criterion point of 5% (arbitrarily chosen at the discretion of the author), it can be concluded that the 4th and 8th grade samples were indeed representative of their respective state enrollments, both by geographic location and by school size. The 11th grade sample was representative of state enrollments by school size, but is questionable when geographic location is considered (northern schools were slightly over-represented while students from eastern schools were under-represented). However, this variance is not considered sufficient enough to seriously distort the statewide results of the test for the 11th grade.

Administration of the Test

The Comprehensive Test of Basic Skills (CTBS/S) were administered to most schools in the statewide testing program on September 28-30, 1976. Schools in three eastern Idaho districts were allowed to test one week earlier because an early frost had moved their harvest vacations into the last week of September. Although standard testing procedures recommend that at least two full school days be allowed for the completion of the CTBS/S battery, the timeline for the

state program required testing time to be limited to one and one-half school days in the 4th grade and one day (or two half-days) in the 8th and 11th grades. This left an unrealistic one to one-and-a-half days for make-up testing. The statewide testing effort was completed basically as scheduled, except for one school which did not administer any mathematics tests to its 4th grade students (this was not discovered until after the answer sheets had been scored). The extent of make-up testing is not known.

The administration of the CTBS/S battery in each school was supervised by a "test coordinator" appointed by the district superintendent and trained by State Department of Education staff. It was the option of the test coordinator to determine who would actually administer the battery to the students as each school and each grade level had its own unique situation. Generally, teachers administered the tests in the elementary schools and counselors gave the tests in the secondary schools. In one small district, however, the superintendent himself administered the CTBS/S to his 4th grade students. The test coordinator was expected to either give the tests himself/herself or to instruct those serving as examiners about the standardized administration procedures.

During the first two weeks of September, workshops for test coordinators were conducted by the State Department of Education in six locations around the state--Idaho Falls,

Pocatello, Twin Falls, Boise, Lewiston and Coeur d'Alene. Each workshop, which lasted approximately four hours, was designed to acquaint test coordinators with the history and development of the goals and objectives of the testing program, to review the CTBS/S materials and standardized procedures to be followed in the administration, to review preparation of answer sheets for scoring, to consider the format and use of the extensive information the participating schools would receive about their students, and to answer any questions about the program.

The CTBS/S materials, which included the test battery and answer sheets, were mailed directly to each participating school by the test publisher. Since the quantities sent to each school were based on an enrollment estimated from the previous school year, there was some confusion before all schools had received all the materials they needed. After the testing was completed, the CTBS/S materials became the property of the schools.

The state sample upon which the results of the statewide testing were based was smaller than the 1,000 students at each grade level which had been planned. The difference can be accounted for, generally, by two factors.

First, two schools tested fewer students than had been projected. One school had a smaller enrollment than estimated, so after all its eligible students were included in the state sample, it was still short of its "allotment." The other

school didn't conform to the state program requirements in that it did not administer math tests to any of its students, thus making the whole school ineligible for inclusion in the state sample.

Second, each test coordinator was charged with the responsibility of preparing the answer sheets from his/her school for selection of the state sample by the State Department of Education and for scoring by the publisher. This preparation consisted of dividing the answer sheets into two groups--one of alphabetized completed answer sheets, i.e. answer sheets which indicated that the student had participated on each of the CTBS/S tests administered, and one of incomplete answer sheets. The answer sheets of all students would be scored and the results reported to the schools, but only completed answer sheets were eligible for the state sample. This assignment, however, was not accurately completed by all test coordinators, resulting in the selection of some incomplete answer sheets for the state sample. It was decided that, as far as possible, the incomplete answer sheets would be deleted from the state sample.

Data Processing and Analyses

After testing was completed in the schools, all answer sheets were sent to the State Department of Education. There the answer sheets of students in the state sample were marked for future computer identification. The materials were then shipped to the test publisher for computer scoring. School

results were mailed directly to the test coordinator for each school. The only information returned to the State Department of Education was summary reports on the students in the state sample. The data collection and processing procedures were designed so that no individual student, teacher, school or district could be identified by the information housed within the State Department of Education.

The scoring reports sent directly to the schools included the following:

(1) Individual Test Record. This report shows the student's performance on each of the CTBS/S tests in terms of four scores (raw score, scale score, national percentile and Idaho percentile). It also shows which questions the student attempted and which of those the student answered correctly or incorrectly.

(2) Self-Stick Label. This label provides a convenient way of recording the four student scores on each CTBS/S test in the student's folder.

(3) Class Record Sheet. This report lists in alphabetical order each student in a classroom and displays their four scores.

(4) Right Response Summary. This report shows for each question on the CTBS/S tests the percentage of students in the classroom who answered correctly and the percentage of students in the national norm group who answered correctly.

(5) Frequency Distribution Chart. This report provides for each school a summary description of the distribution of its students over the range of grade equivalents and the mean grade equivalent on each test for the school as a whole.

This information was provided to each school as a "reward" for its participation in the statewide testing program. Each school was informed that the analysis, interpretation and

public distribution of its results should be conducted according to district guidelines and policies.

The scoring reports received at the state level included the following (one set for each of the three grade levels):

(1) Three state frequency distributions (one each for raw scores, grade equivalents and scale scores) which describes the distribution, range and mean of students in the state sample for each of the CTBS/S tests.

(2) The right response summary which lists, for each question on the CTBS/S battery, the percentage of students in the state sample who answered correctly and the percentage of national norm students who answered correctly.

(3) A cluster analysis showing descriptive statistics for each cluster, and a customized statistical analysis which establishes the 95% Confidence Interval for the mean scale score on each CTBS/S test.

The results reported in this paper primarily come out of the state frequency distributions with use of some right response summary information to examine some of the findings in more detail. The outcomes of the cluster analysis and the custom statistical analysis will not be reported in this paper. The usefulness of their resultant information depends on a strict adherence to statistical and procedural requirements. Unfortunately, there were enough irregularities during the operation of the statewide testing program that the results of these two analyses are not subject to statistically valid interpretation.

The analysis of data gathered through the statewide testing program was directed to three general questions:

(1) How do the three grades taken together compare to the national norm in mean performance on each of the major subject areas measured by the CTBS/S?

(2) How did each grade compare to the national norm on mean performance on each of the CTBS/S tests?

(3) How did Idaho's "lower" and "upper" students compare to their counterparts in the national norm groups?

The answers to these three questions are discussed in the next chapter.

# RESULTS

This chapter presents in four sections the results of the Idaho Statewide Testing Program for 1976-77. The first section defines the scores used in data analysis and reporting. The second section describes mean (average) student achievement for each of seven CTBS/S subject areas. The third section presents mean student achievement on the CTBS/S for each of the three grade levels. And last, the fourth section displays the basic skills achievement of Idaho's lower and upper students.

## Definition of Scores

The results of the statewide testing program were computed and are reported in terms of several scores:

(1) Raw Score. When a test is scored, the first score obtained is the raw score or, simply, the number of questions which were answered correctly. The raw score lacks meaning because it cannot be compared to a raw score on other tests. This is because the number of items and the difficulty of items differ from test to test.

(2) Scale Score. Scale scores are produced from a single, equal interval scale of scores across all grades for use with all levels of the CTBS/S. These scale scores, expressed in three-digit numbers from 000 to 999, enable the user to chart a student's growth from kindergarten through grade 12, regardless of which CTBS/S levels were given. Scale scores have the statistical advantage over other scores (such as grade equivalent and percentile rank) in that they can be averaged. Scale scores, however, do not have intrinsic meaning for users unless the users have a thorough grasp of the concept of the normal distribution curve.

(3) Grade Equivalent. The grade equivalent for a particular scale score represents the year and month of school for which that scale score is the median. For example, if the median scale score for all students in the second month of grade 4 (i.e. 4.2) is 397 on a certain test, then it is said that the grade equivalent of a scale score of 397 on that test is 4.2 (4th grade, 2nd month).

(4) Percentile Rank. The percentile rank is not the percentage of items answered correctly. The percentile rank for a particular score may be interpreted as the percentage of students in the group which had a lower score. It is computed as the percentage of students with a lower score plus one-half the number of students with the same score. Thus, if a particular score has a percentile rank of 57, this would mean that approximately 57% of the students scored below that score.

## Subject Area Results

The CTBS/S provided measures of basic skills in reading, language, mathematics, total battery (combination of reading, language and mathematics) and reference skills in grades 4, 8 and 11. Measures for science and social studies were also obtained for grades 8 and 11. The results of the three grades for each subject area are presented on Figure 1 through Figure 7: Reading Total (Figure 1), Language Total (Figure 2), mathematics Total (Figure 3), Total Battery (Figure 4), Reference Skills (Figure 5), Science (Figure 6) and Social Studies (Figure 7).

These figures graphically compare the grade equivalent of Idaho students' obtained mean scale score to the nationally expected grade equivalent. Since students were tested in September, the expected grade equivalents were 4.0, 8.0 and

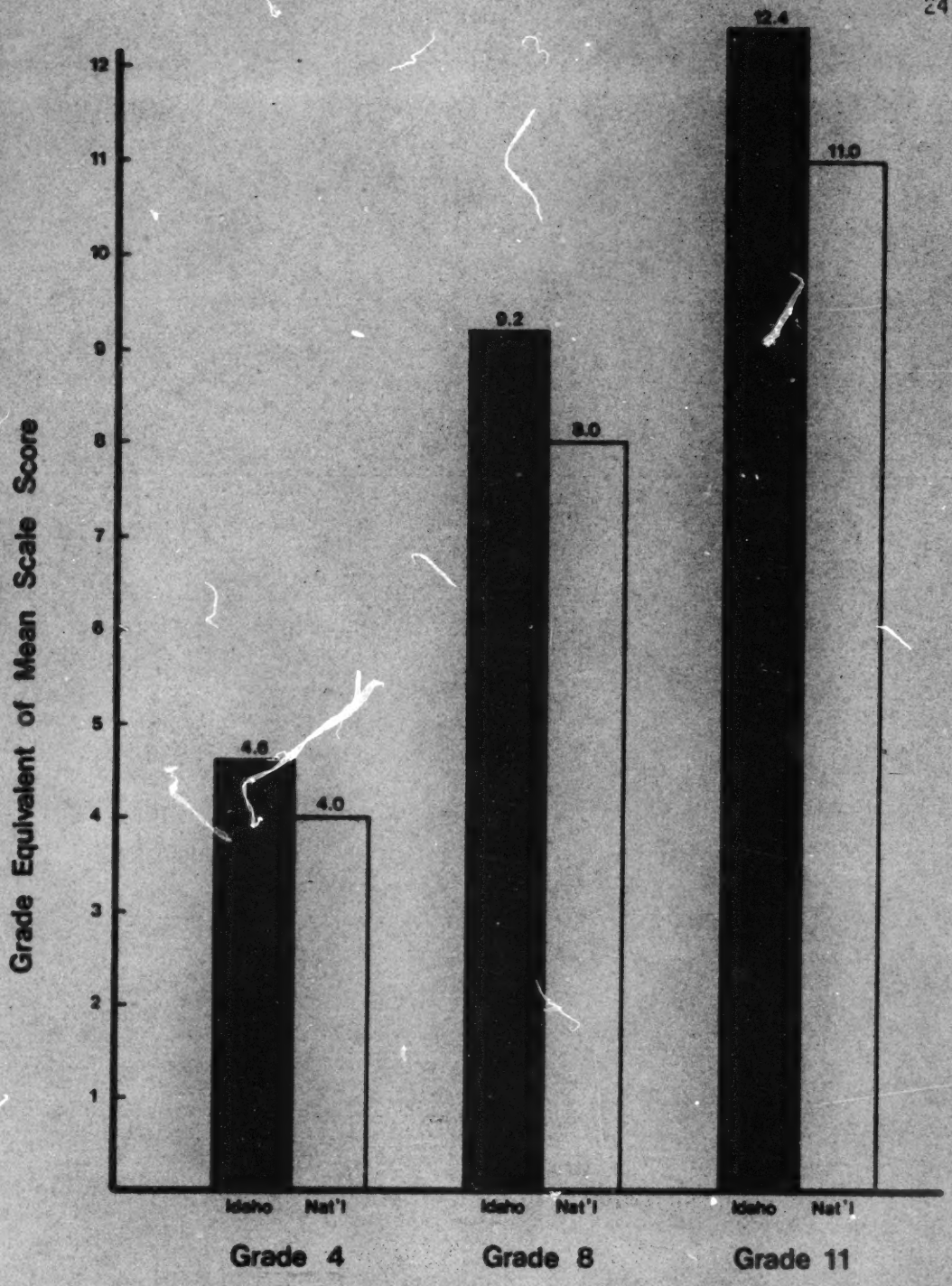


**FIGURE 1. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) READING TOTAL FOR GRADES 4, 8 AND 11**

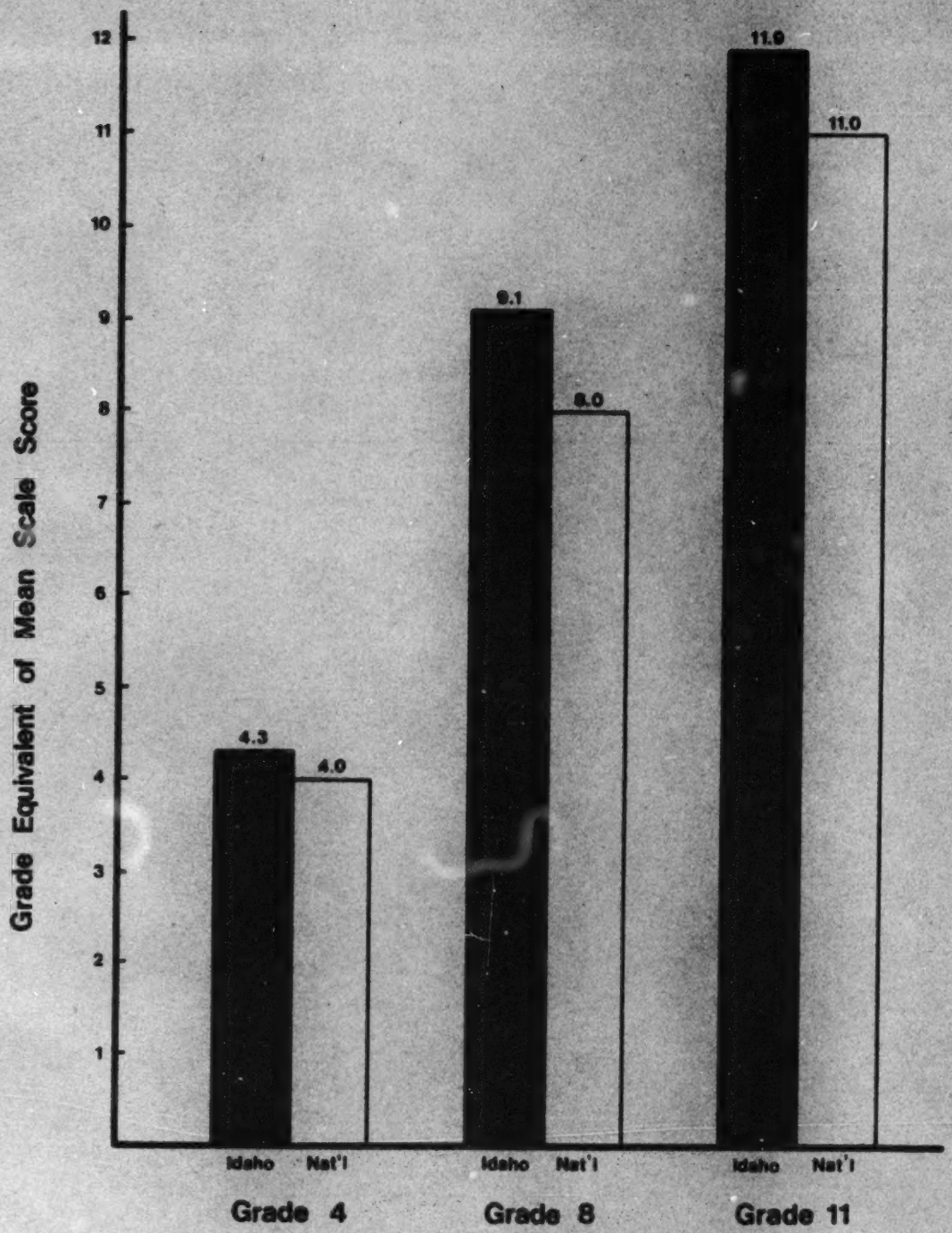


**FIGURE 2. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) LANGUAGE TOTAL FOR GRADES 4, 8 AND 11**

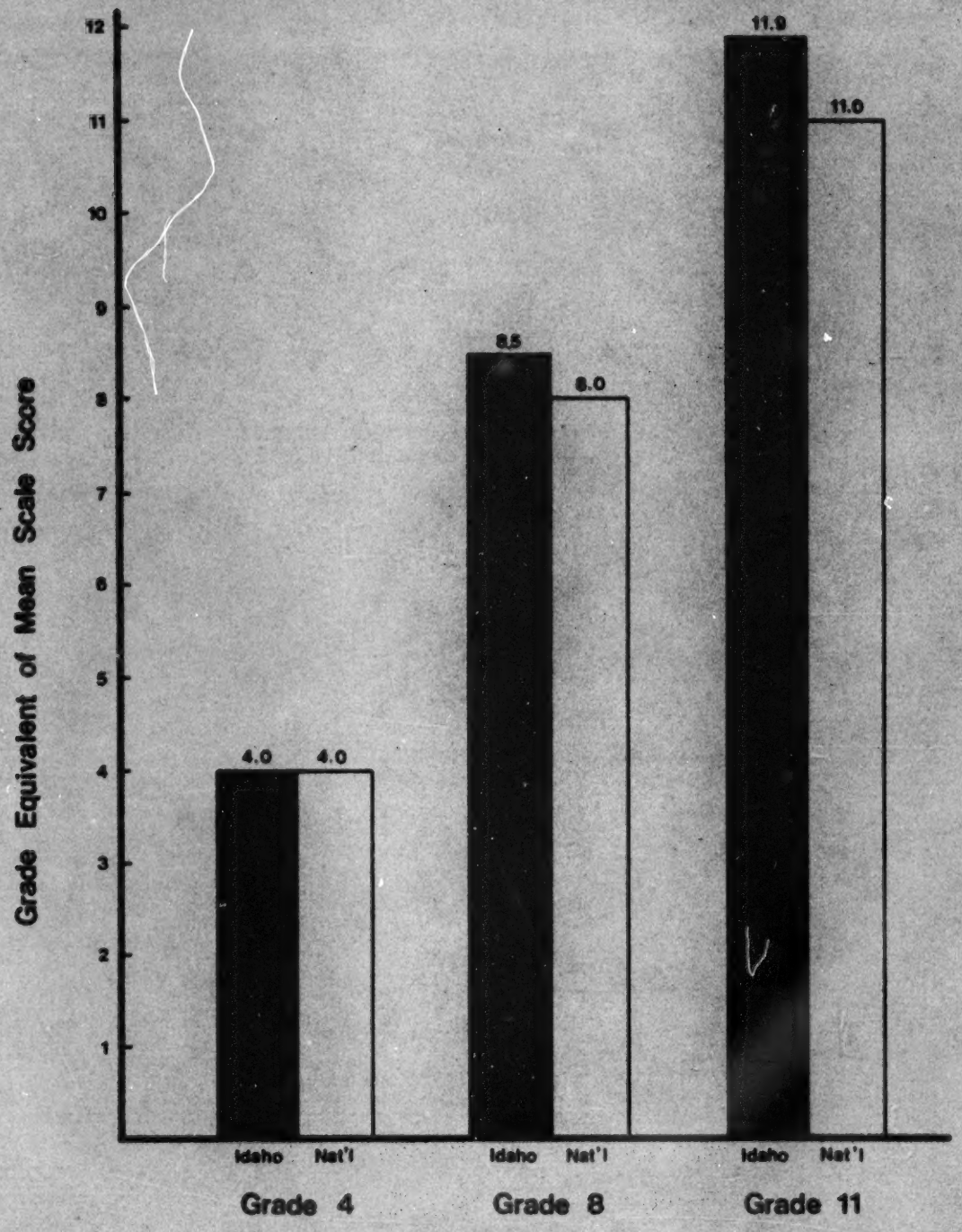


**FIGURE 3. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) MATHEMATICS TOTAL FOR GRADES 4, 8 AND 11**

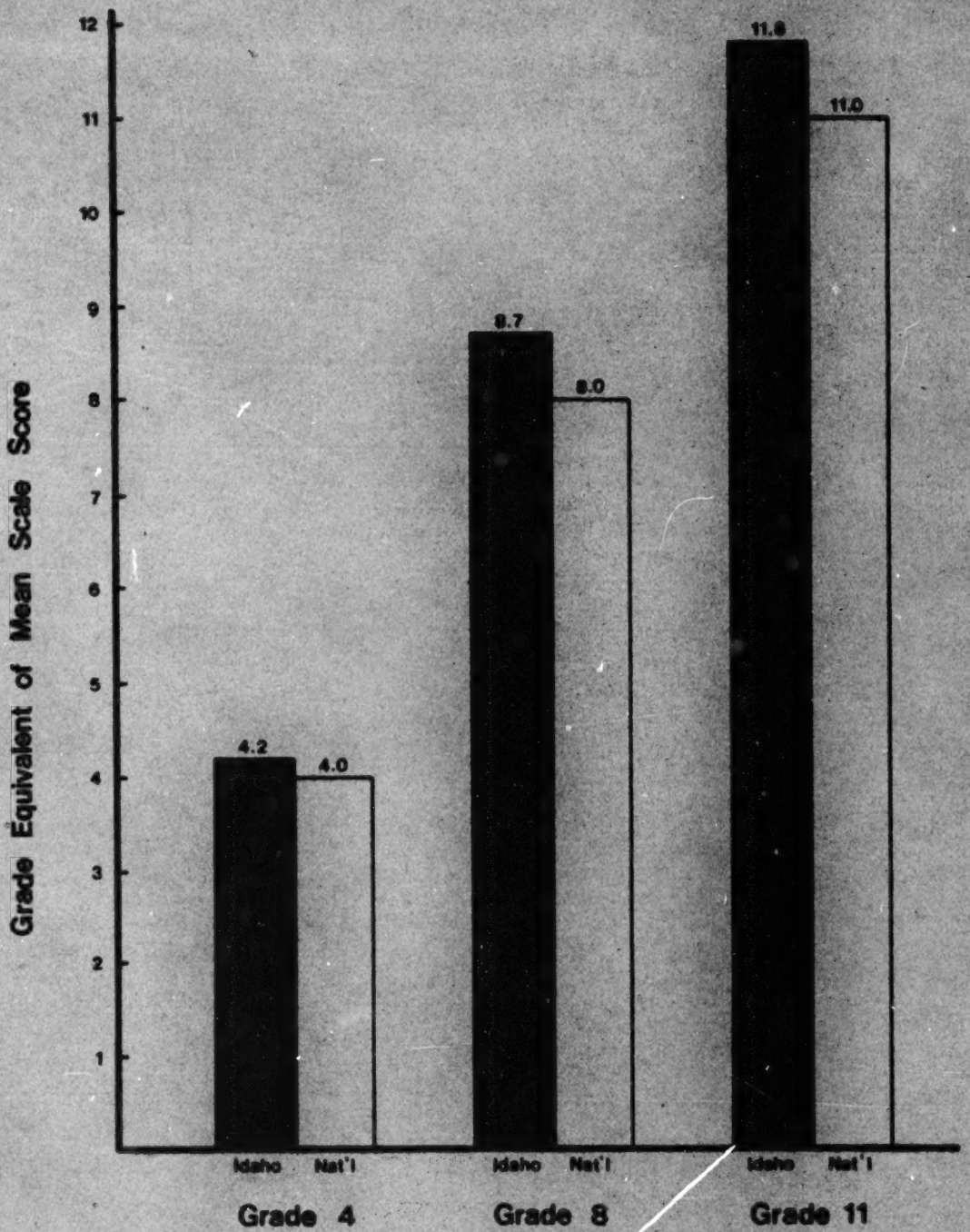


**FIGURE 4. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) TOTAL BATTERY FOR GRADES 4, 8 AND 11**

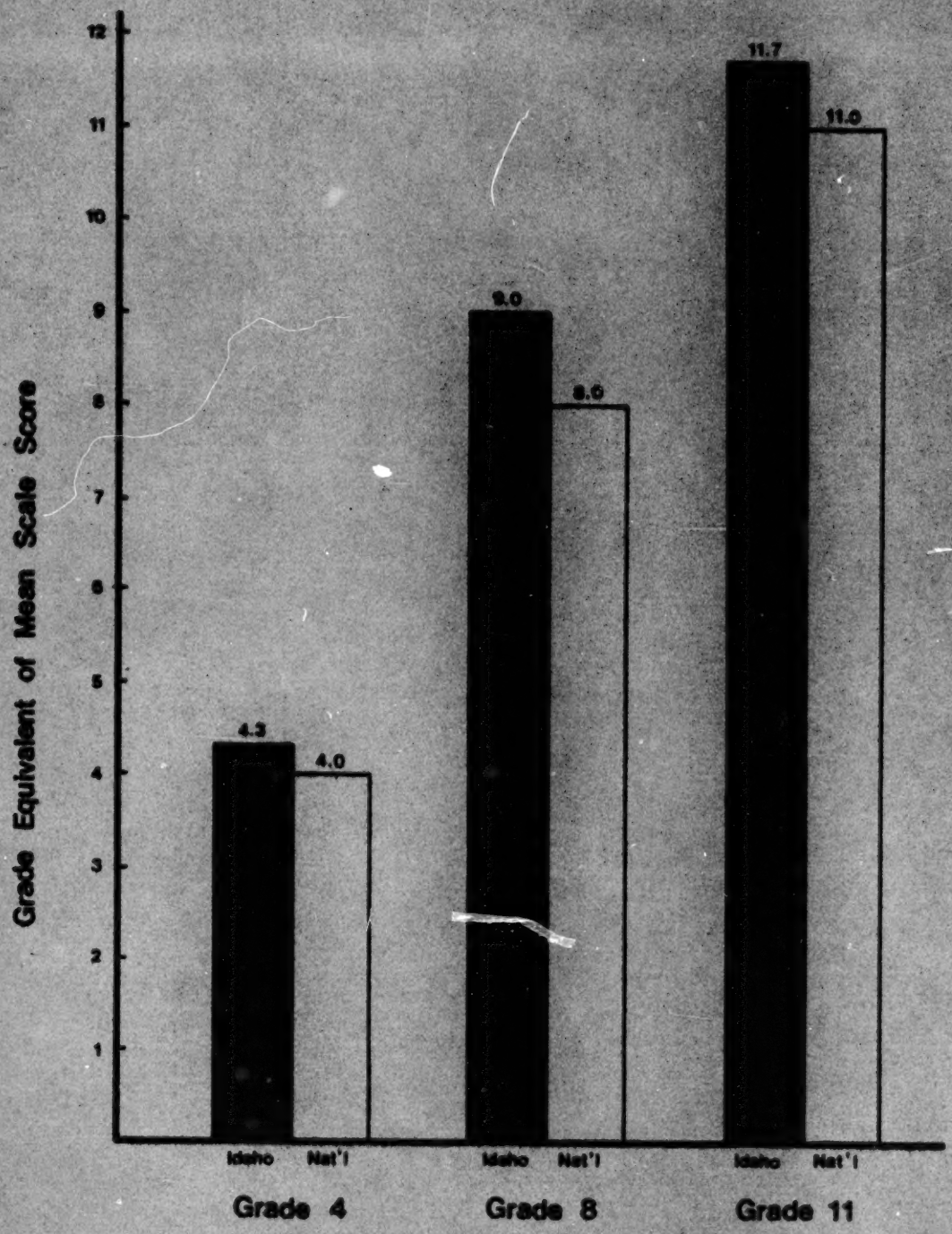


**FIGURE 5. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) REFERENCE SKILLS FOR GRADES 4, 8 AND 11**

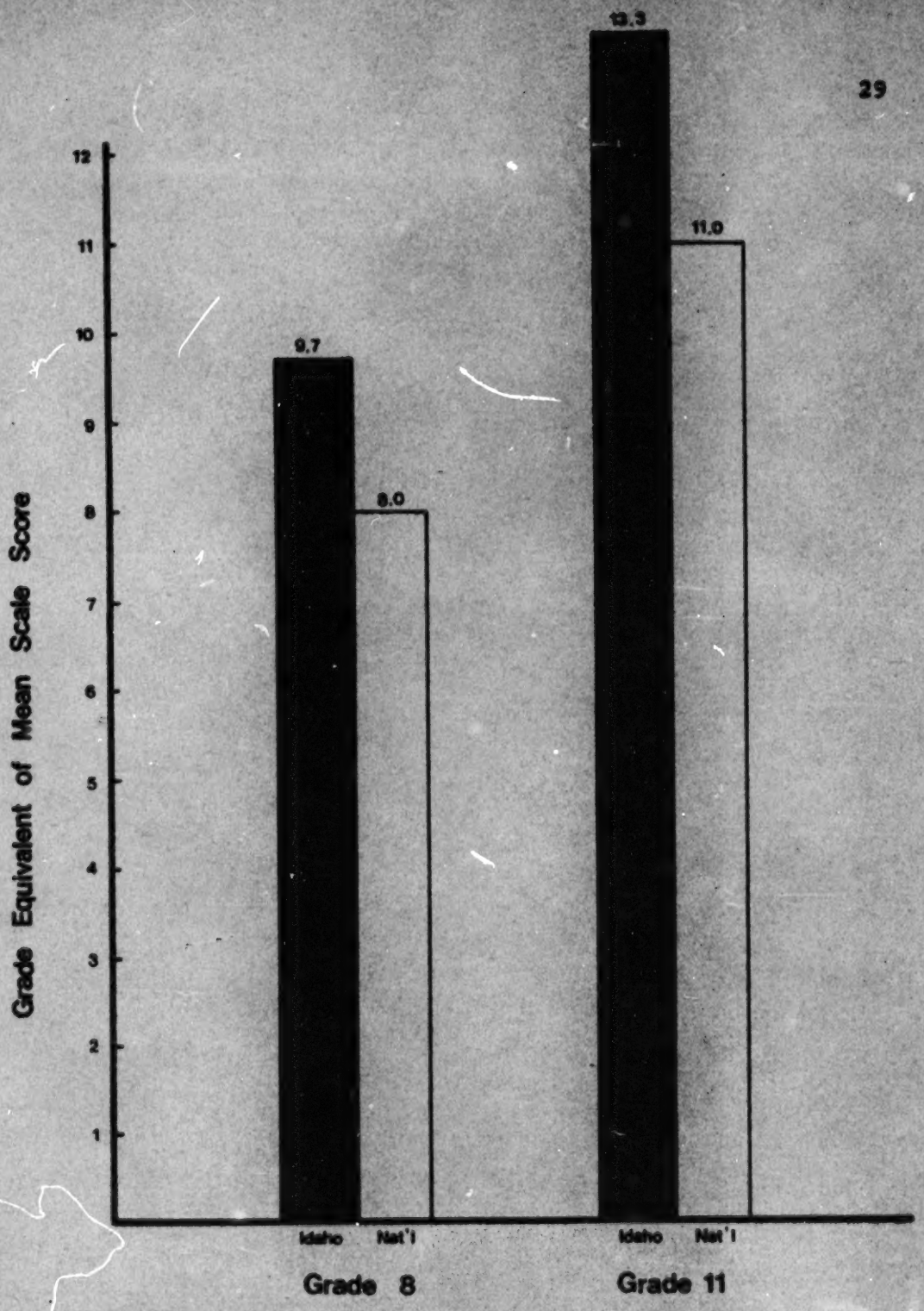


**FIGURE 6. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) SCIENCE FOR GRADES 8 AND 11**

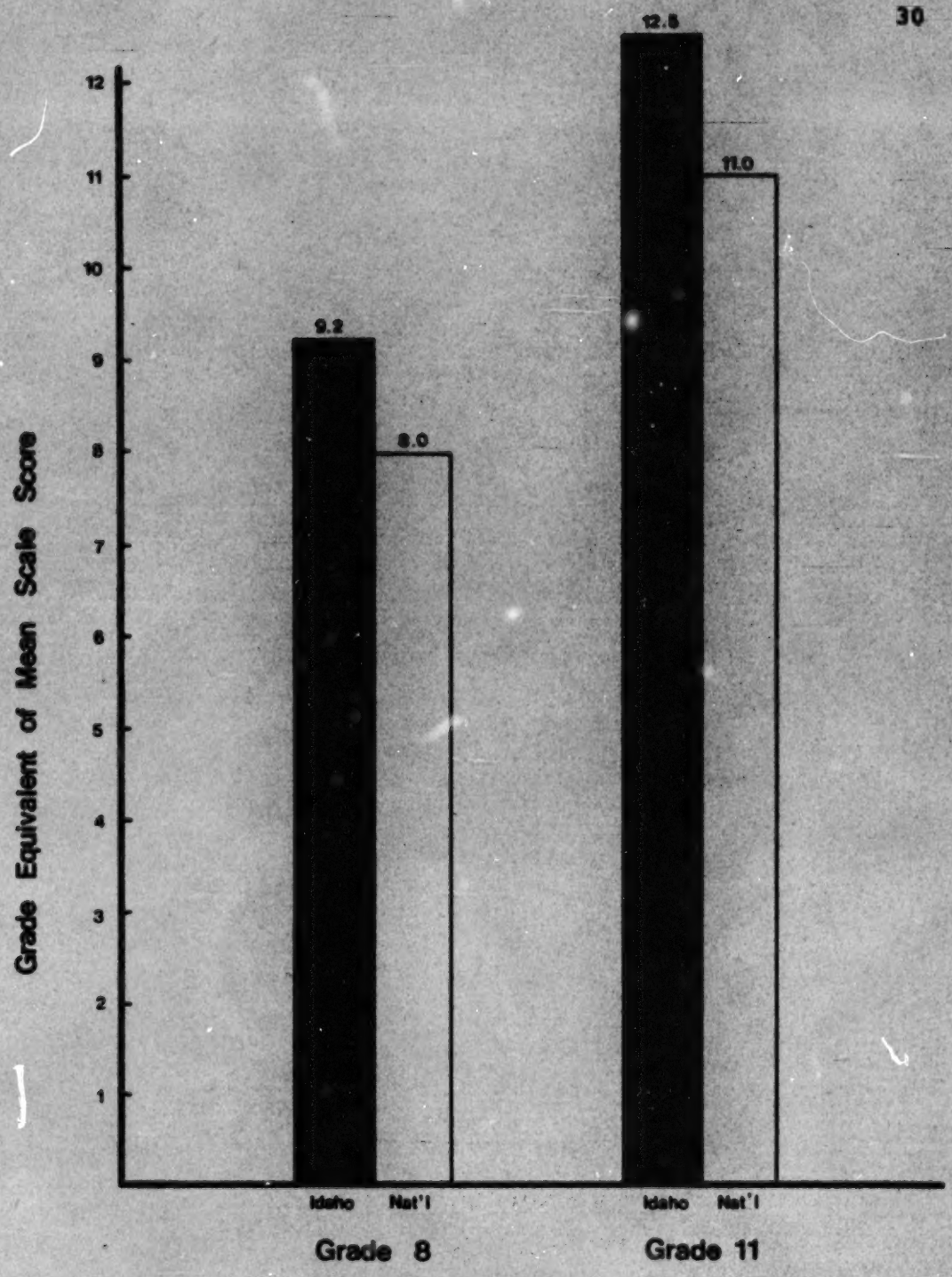


**FIGURE 7. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) SOCIAL STUDIES FOR GRADES 8 AND 11**

and 11.0 for the 4th, 8th and 11th grades, respectively. (4.0 = 4 years, 0 months)

The results show that for each of the major subject areas measured by the CTBS/S, the mean performance of Idaho students is either equal to (as in one instance) or superior to (as in 18 instances) the national norm group. The single instance where Idaho results were equal to the national results was in the 4th grade mathematics total. The most superior performance was displayed in 11th grade science where Idaho students had a mean performance of 2.3 grade equivalents (i.e. 2 years and 3 months) above the national norm group. The comparisons for each of the major CTBS/S subject areas follow:

Reading Total. Figure 1 indicates that on reading total measures the mean performance of the 4th, 8th and 11th grades were, respectively, .6, 1.2 and 1.4 grade equivalents (i.e. 6 months, 1 year 2 months, and 1 year 4 months) above what was expected.

Language Total. Figure 2 indicates that on language total measures the mean performance of the 4th, 8th and 11th grades were, respectively, .3, 1.1 and .9 grade equivalents (or 3 months, 1 year 1 month, and 9 months) above the national norm.

Mathematics Total. Figure 3 indicates that on mathematics total measures the mean performance of the 4th grade was the same as the national norm and that the mean performance of the 8th and 11th grades were, respectively, 1.1 and .9 grade equivalents above what was expected.

Total Battery. Figure 4 indicates that on total battery measures the mean performance of the 4th, 8th and 11th grades were, respectively, .2, .7 and .8 grade equivalents above the national norm.

Reference Skills. Figure 5 indicates that on reference skills measures the mean performance of the 4th, 8th and 11th grades were, respectively, .3, 1.0 and .7 grade equivalents above what was expected.

Science. Figure 6 indicates that on science measures the mean performance of the 8th and 11th grades were, respectively, 1.7 and 2.3 grade equivalents above the national norm.

Social Studies. Figure 7 indicates that on social studies measures the mean performance of the 8th and 11th grades were, respectively, 1.2 and 1.5 grade equivalents above what was expected.

## Grade Level Results

Thirteen CTBS/S measures of basic skills were obtained for the 4th grade, and fifteen CTBS/S scores were obtained for the 8th and 11th grades. The results for the 4th grade are shown on Figure 8, the 8th grade on Figure 9 and the 11th grade on Figure 10. The expected performance, based on national norms, is indicated on the figures by a horizontal line across the chart with the grade equivalent values of 4.0, 8.0 and 11.0 for the 4th, 8th and 11th grades, respectively. Any deviation from expected performance in favor of Idaho students is represented on the figures by a bar extending upward from the horizontal line while any difference unfavorable to Idaho students is indicated by a bar extending downward.

Grade 4. Figure 8 indicates that Idaho's 4th grade students scored at or above the national norm on 11 of the 13 CTBS/S measures of basic skills. The 4th graders' best performance in relationship to the norm group was on the language expression test where Idaho students scored a grade equivalent of 4.8 rather than the expected 4.0. Reading vocabulary, reading comprehension and mathematics concepts followed closely behind with obtained grade equivalents of 4.7, 4.7 and 4.6,

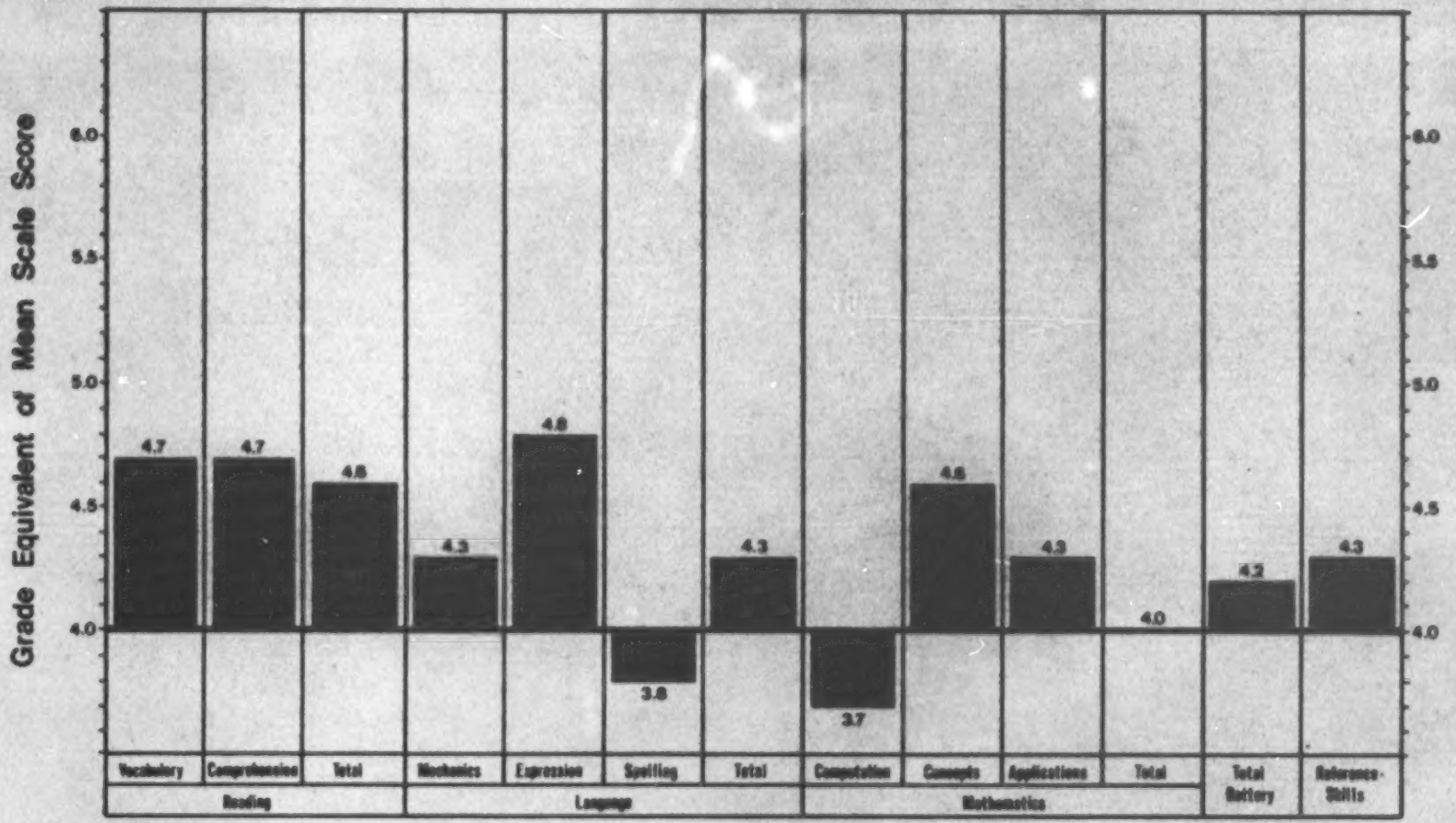


**FIGURE 8. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) FOR GRADE 4**

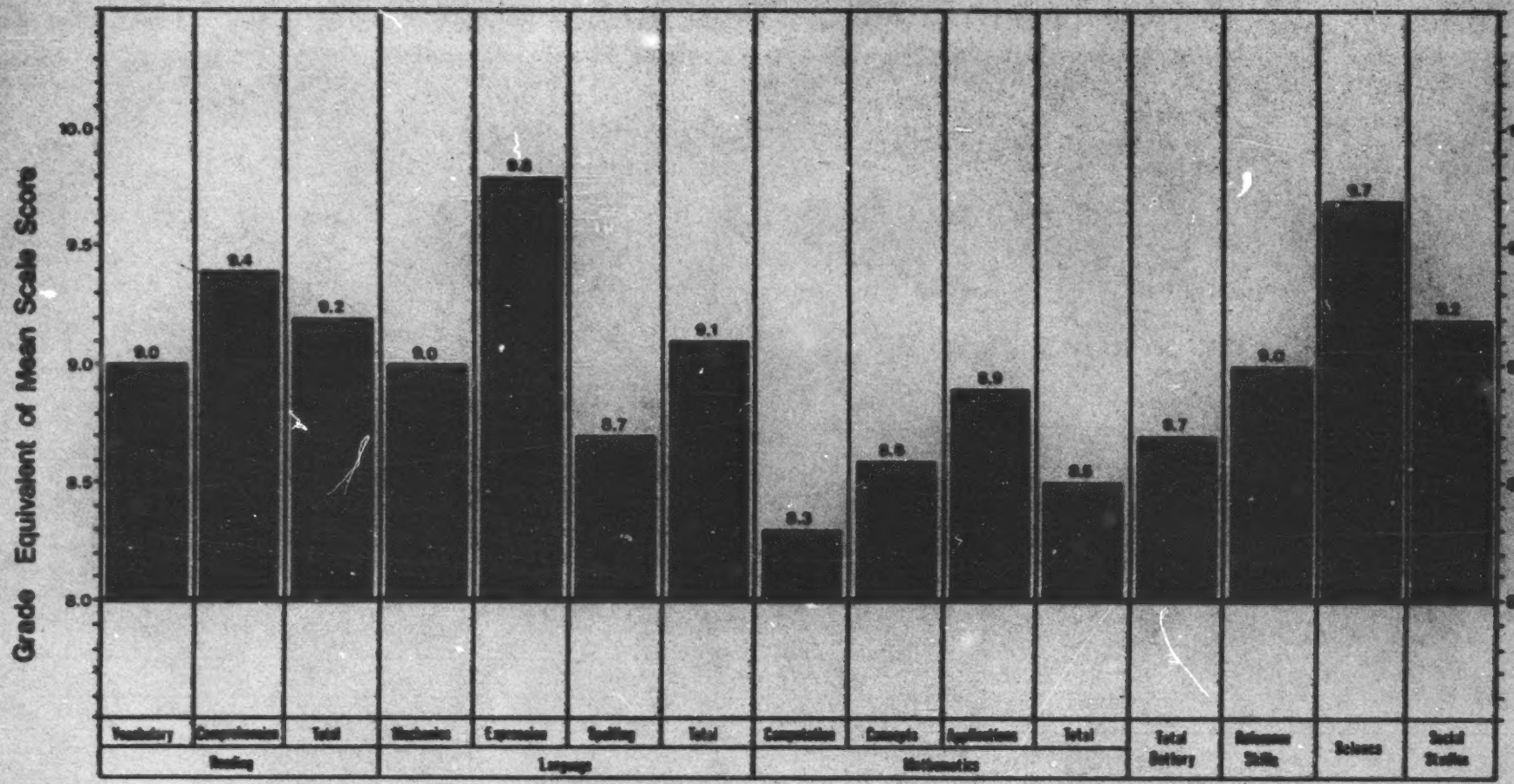


FIGURE 9. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) FOR GRADE 8 [34]

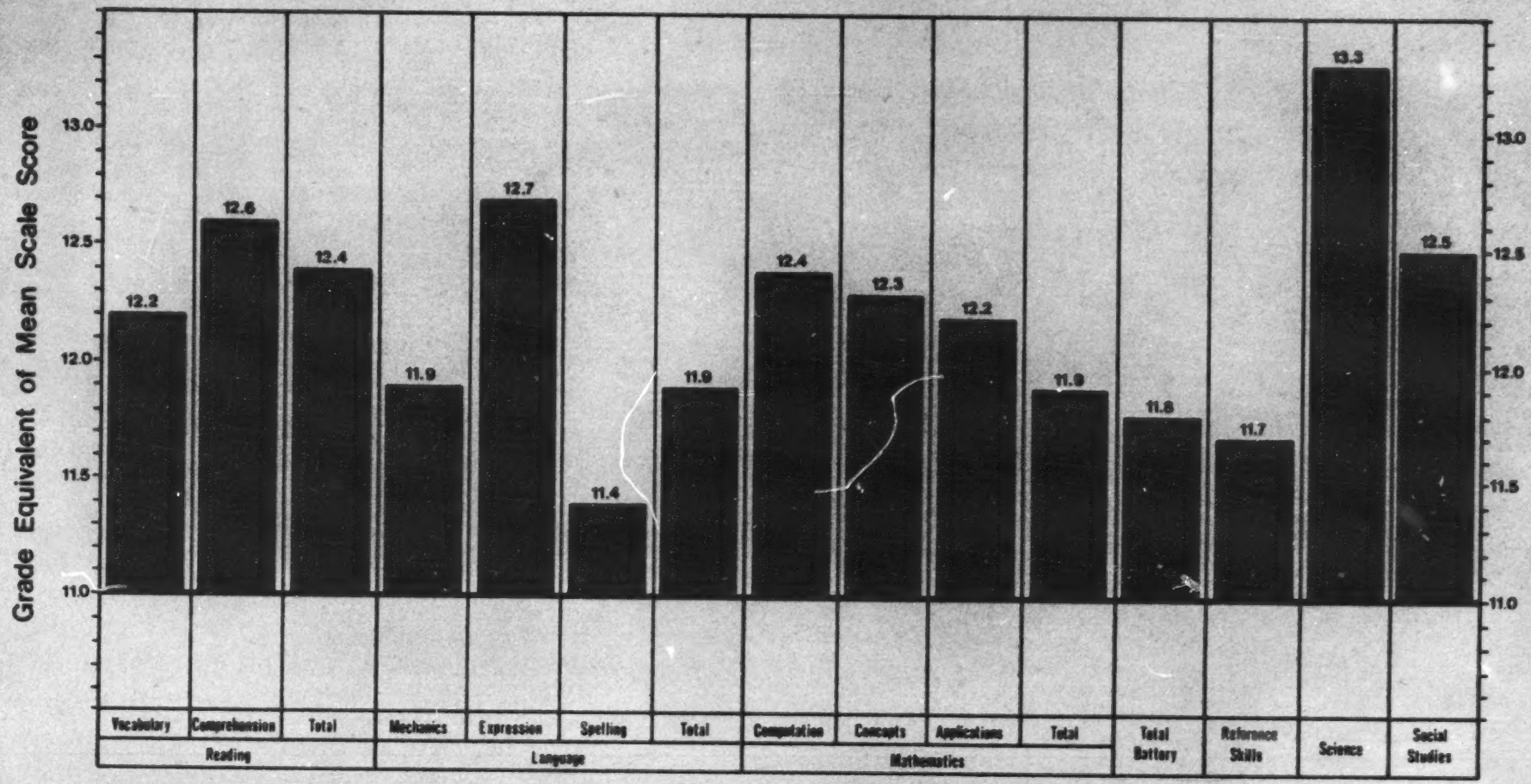


FIGURE 10. IDAHO VS. NATIONAL RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) FOR GRADE 11

respectively. Figure 8 also indicates that Idaho's 4th grade students scored below the national norm by two months on the spelling test and by three months on the mathematics computation test.

When Idaho students were matched against the norm group in terms of percentage of correct responses on the spelling test, there was no percentage difference in the ability of the two groups to recognize words which had been spelled correctly or incorrectly. Idaho students, however, were one percentage point below the national norm (64% to 65%) when the ability to recognize "spelling errors" was tested. However, these were not actual spelling errors but rather incorrect uses of homonyms (e.g. to, too, two).

When Idaho students were compared with the norm group in terms of percentage of correct responses on the mathematics computation test, Idaho students had a one percentage point advantage over the national norm on both addition skills (78% to 77%) and subtraction skills (71% to 70%). However, the Idaho students were five percentage points below the national norm in multiplication skills (65% to 70%) and eight percentage points behind the national norm in division skills (60% to 68%).

Grade 8. Figure 9 indicates that Idaho's 8th grade students scored above the national norm on all 15 of the CTBS/S measures of basic skills. Language expression and science were the two areas where Idaho students excelled most in

relationship to the expected grade equivalent of 8.0. They scored a grade equivalent of 9.8 in language expression and of 9.7 in science. The 8th grade's smallest advantage over the national group was on the mathematics computation test, where Idaho students scored a grade equivalent of 8.3 or three months above expectation.

Grade 11. Figure 10 indicates that Idaho's 11th grade students scored above the national norm on all 15 of the CTBS/S measures of basic skills. Science was the area where Idaho students excelled most in relationship to the expected grade equivalent of 11.0, by scoring a grade equivalent of 13.3. The 11th grade's smallest advantage over the national group was on the spelling test, where Idaho students scored four months above the norm with a grade equivalent of 11.4.

## Quartile Results

Quartile scores provide a way to compare the lower quarter and the upper quarter of students in the state sample with their counterparts in the national standardization group on each of the CTBS/S measures. The Idaho vs. national quartile results for the 4th, 8th and 11th grades are presented on Figure 11, Figure 12 and Figure 13, respectively. The three vertical lines on each figure indicate the three national quartiles with national percentile ranks of 25, 50 and 75, and the three plotted values for each measure represent the Idaho quartiles expressed as national percentile ranks.

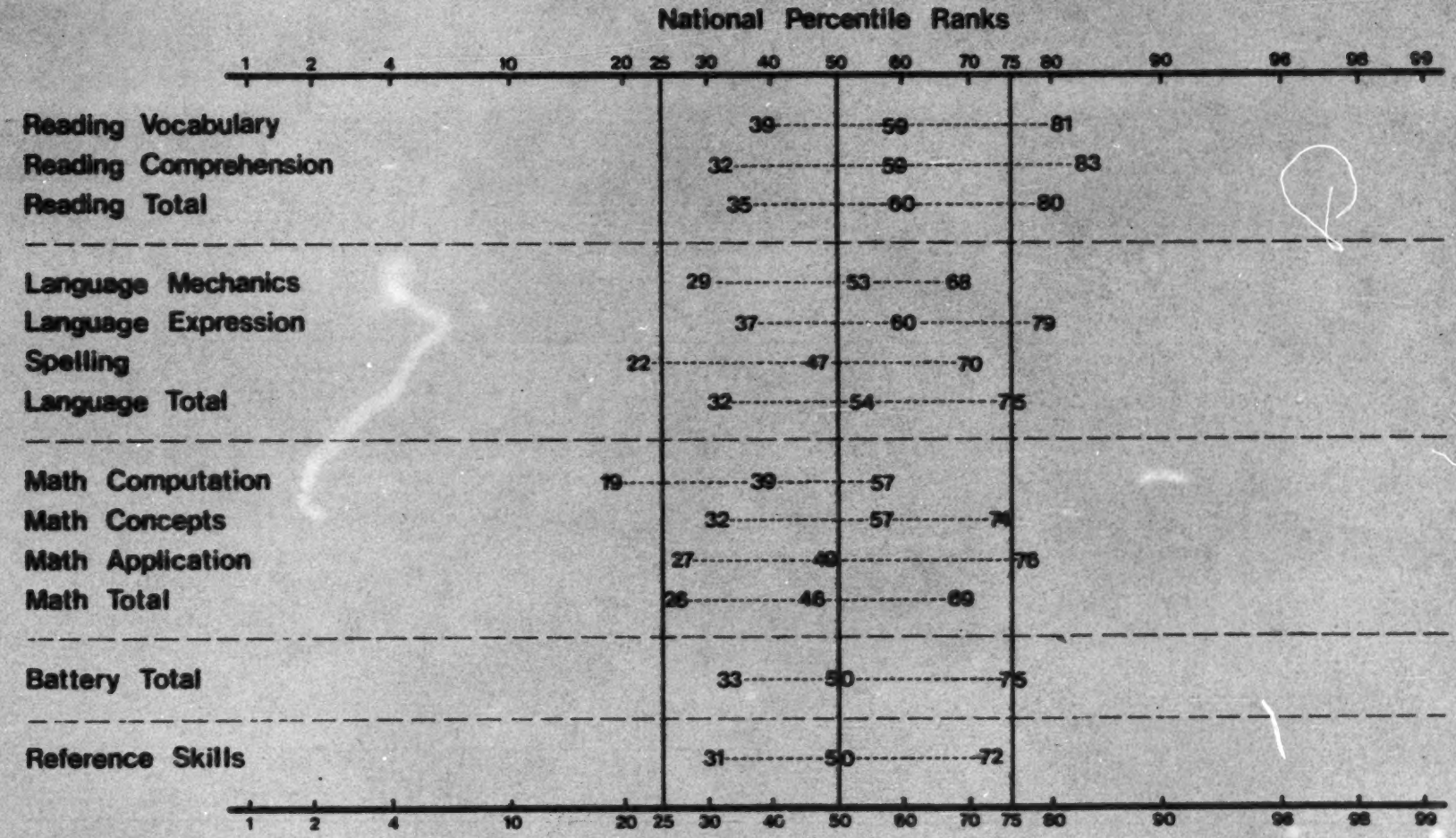
National Percentile Ranks
1 2 4 10 20 25 30 40 50 60 70 75 80 90 95 98 99
Reading Vocabulary 39 59 81
Reading Comprehension 32 59 83
Reading Total 35 60 80
Language Mechanics 29 53 68
Language Expression 37 60 79
Spelling 22 47 70
Language Total 32 54 75
Math Computation 19 39 57
Math Concepts 32 57 79
Math Application 27 48 76
Math Total 26 46 69
Battery Total 33 50 75
Reference Skills 31 50 72
1 2 4 10 20 25 30 40 50 60 70 75 80 90 95 98 99

**FIGURE 11. IDAHO VS. NATIONAL QUARTILE RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) FOR GRADE 4** [38]

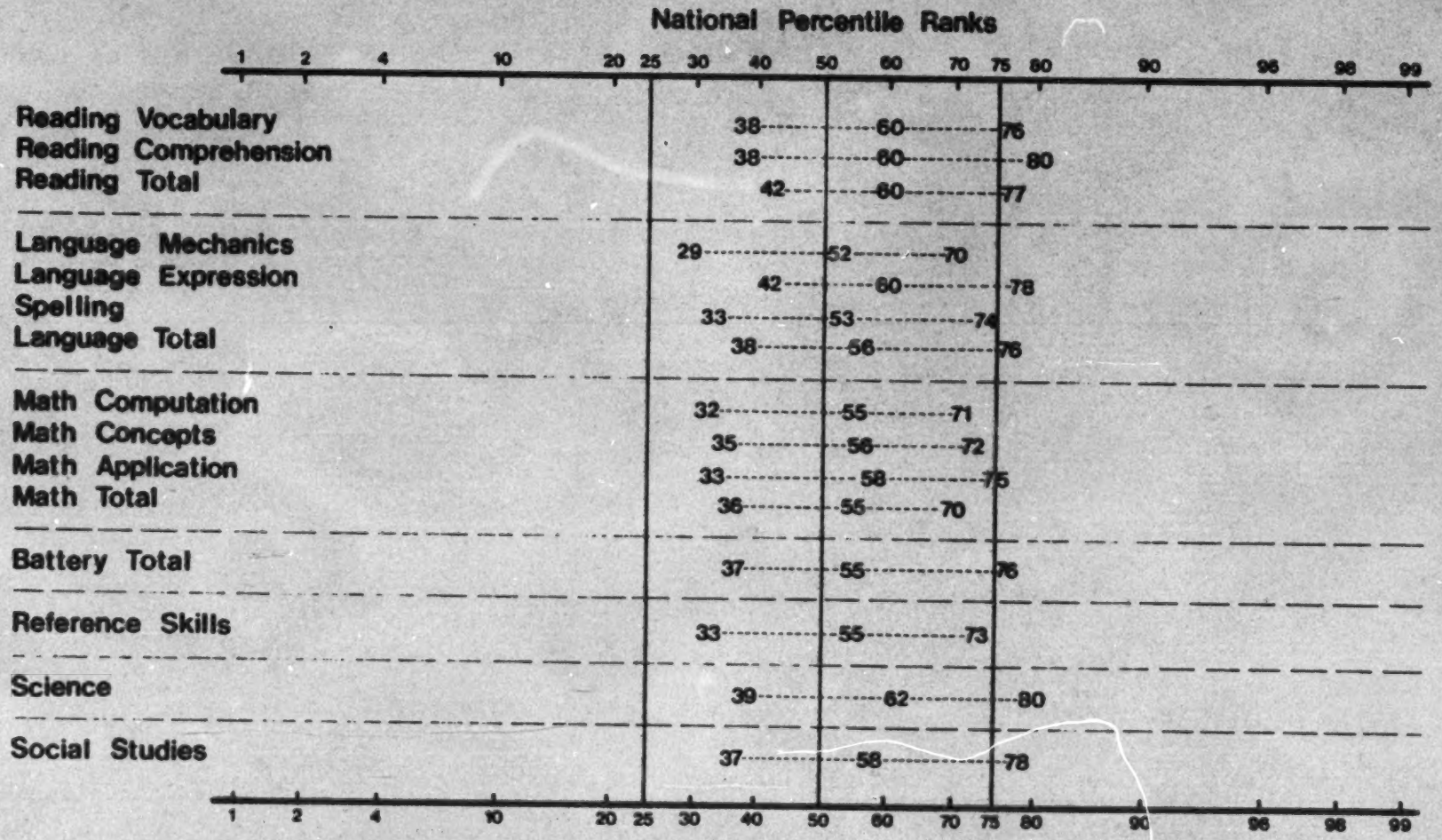
National Percentile Ranks
1 2 4 10 20 25 30 40 50 60 70 75 80 90 95 98 99
Reading Vocabulary 38 60 76
Reading Comprehension 38 60 80
Reading Total 42 60 77
Langusge Mechanics 29 52 70
Language Expression 42 60 78
Spelling 33 53 74
Language Total 38 56 76
Math Computation 32 55 71
Math Concepts 35 56 72
Math Application 33 58 75
Math Total 36 55 70
Battery Total 37 55 76
Reference Skills 33 55 73
Science 39 62 80
Social Studies 37 58 78
1 2 4 10 20 25 30 40 50 60 70 75 80 90 95 98 99

**FIGURE 12. IDAHO VS. NATIONAL QUARTILE RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) FOR GRADE 8**

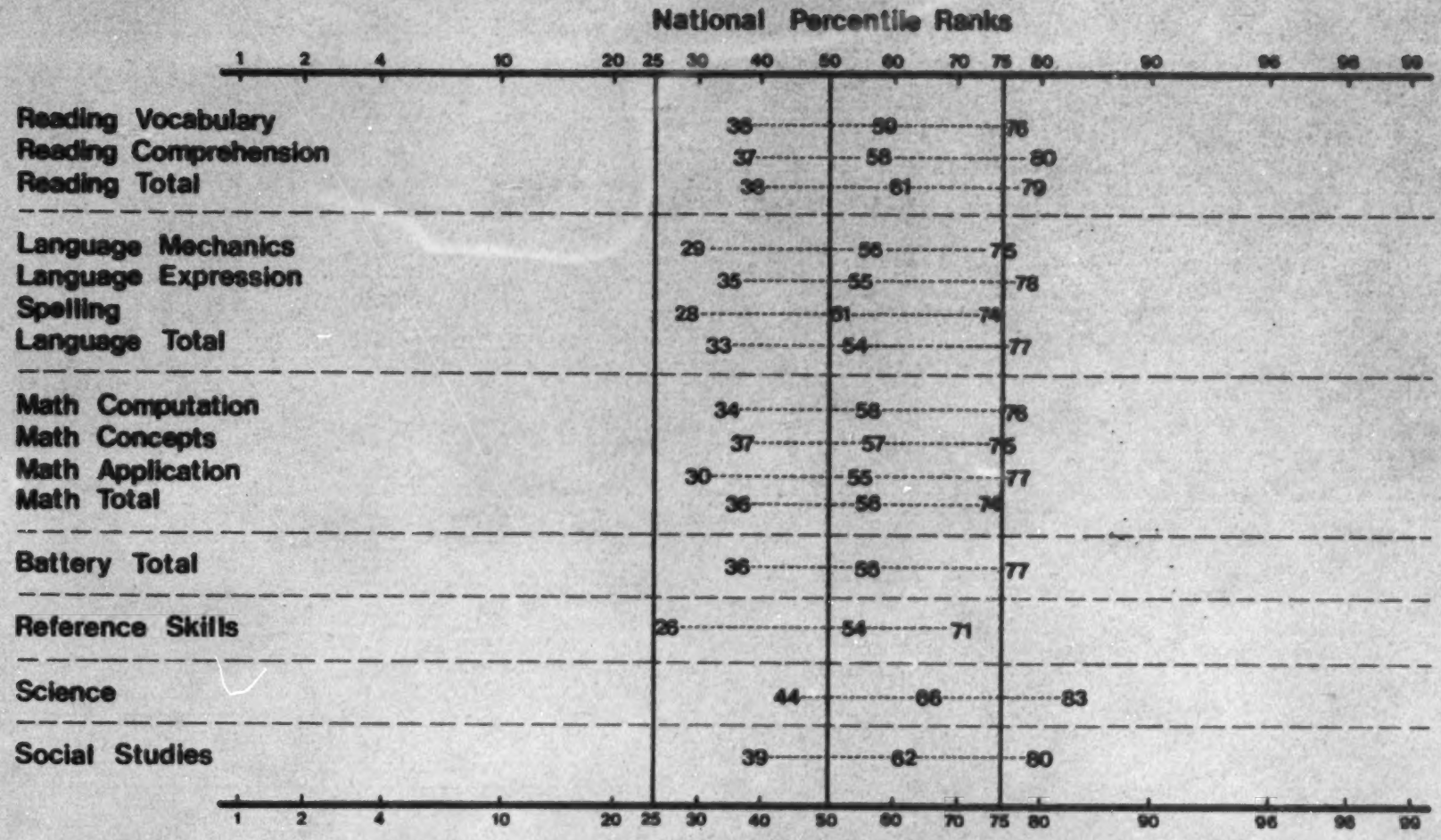
National Percentile Ranks
1 2 4 10 20 25 30 40 50 60 70 75 80 90 95 98 99
Reading Vocabulary 35 59 76
Reading Comprehension 37 58 80
Reading Total 38 61 79
Language Mechanics 29 56 75
Language Expression 35 55 78
Spelling 28 61 74
Language Total 33 54 77
Math Computation 34 58 76
Math Concepts 37 57 75
Math Application 30 55 77
Math Total 36 56 74
Battery Total 36 56 77
Reference Skills 26 54 71
Science 44 66 83
Social Studies 39 62 80
1 2 4 10 20 25 30 40 50 60 70 75 80 90 95 98 99

**FIGURE 13. IDAHO VS. NATIONAL QUARTILE RESULTS ON THE COMPREHENSIVE TESTS OF BASIC SKILLS (CTBS/S) FOR GRADE 11**

To read the figures, using the 4th grade reference skills test as an example (see bottom line of Figure 11), note that the lower quartile of Idaho students scored at the 31st national percentile rank which is six (+6) comparison points above the score for the lower quartile of national students. Note also that the Idaho upper quartile of students scored at the 72nd national percentile rank which is three (-3) points below the national upper quartile of students. From this example, it could be concluded that in 4th grade reference skills Idaho's lower students performed better than expected while Idaho's upper students did not do as well as expected, the national norm group defining what is expected.

Grade 4. Figure 11 indicates that Idaho's 4th grade lower quartile students performed better than their national counterpart on 11 of the 13 CTBS/S measures. Their best performance relative to the norm group was in reading vocabulary where they scored 14 points (i.e. percentile ranks) above the national expectation. The two tests where first quartile students fell below the national norm were spelling (-3 points) and mathematics computation (-6 points).

Figure 11 also indicates that Idaho's 4th grade upper quartile students performed better than their national counterpart on five of the 13 CTBS/S measures, performed the same as the norm group on two measures, and performed below expectation on six measures. The range of comparison scores was defined by the reading comprehension score (+8 points) and the mathematics computation test (-18 points).

These quartile results for the 4th grade present new information on the two measures--spelling and mathematics computation--where the Idaho students' grade equivalents of the mean scale scores were below the national norm. It can be seen on Figure 11 that on the spelling test both the lower (-3 points) and upper (-5 points) groups of students scored below the national norm. Similarly, both the lower (-6 points) and the upper (-18 points) groups did not perform as well as expected on the mathematics computation test. The difference, however, was that both upper and lower students contributed about the same to the low mean score on the spelling test, while on the mathematics computation test the shortcomings of the upper group exerted a greater influence on producing the below average score than did those of the lower group.

Grade 8. Figure 12 also indicates that Idaho's lower quartile students performed better than their national counterpart on all 15 of the CTBS/S measures. The range of Comparison scores was from +17 points for reading total and language expression to +4 points for language mechanics.

Figure 12 also indicates that Idaho's upper quartile students scored better than their national counterpart on eight CTBS/S measures, scored the same as the norm group on one measure, and scored below expectation on six measures. The range of comparison scores was from +5 points for reading comprehension and science to -5 points for language mechanics and mathematics total.

Grade 11. Figure 13 indicates that Idaho's lower quartile students performed better than their national counterpart on all 15 of the CTBS/S measures. The range of comparison scores was from +19 points for science to +1 point for reference skills.

Figure 13 also indicates that Idaho's upper quartile students scored better than their national counterpart on ten of the 15 CTBS/S measures, scored the same as the norm group on two measures, and scored below expectation on three measures. The range of comparison scores was from +8 points for science to -4 points for reference skills.